CLAIMS

1.   (Currently amended) A system for diagnosing a gastrointestinal tract, comprising:

an ingestible device, arranged for traveling within a gastrointestinal tract of a body, comprising:

a probe, operative to ~~perform~~acquire, along said gastrointestinal tract, a diagnostic image ~~by~~of nuclear radiation of a radiophamaceutical;

data-handling apparatus, in signal communication with said probe, for receiving and handling imaging data, generated by said probe;

a power source, for powering said probe and data-handling apparatus; and

a shell, which encapsulates said probe, data-handling apparatus, and power source within,

wherein said ingestible device comprises a plurality of nuclear-radiation detectors, arranged around said probe, and

circuitry comprising at least one sensor adapted to determine the location and orientation of the ingestible device in the gastrointestinal tract and the circuitry is further adapted to reconstruct the diagnostic image based on said location and orientation.

2.   (Previously presented) The system of claim 1, wherein at least one of said nuclear-radiation detectors is arranged for detecting gamma and beta radiation.

3.   (Previously presented) The system of claim 2, wherein said at least one nuclear-radiation detector is gated substantially to a photon energy associated with a particular radioisotope.

4.   (Previously presented) The system of claim 2, wherein said at least one nuclear-radiation detector is gated substantially to at least two photon energies associated with two particular radioisotopes.

5.   (Canceled).

6.   (Previously presented) The system of claim 1, wherein some of said plurality of nuclear-radiation detectors may be gated substantially to a photon energy associated with a specific radioisotope, while others may be gated substantially to a photon energy associated with a different radioisotope.

7.   (Previously presented) The system of claim 2, wherein said at least one nuclear-radiation detector is not collimated, to detect nuclear radiation impinging at any angle.

8.   (Previously presented) The system of claim 1, wherein said ingestible device is arranged as a compton camera.

9.   (Withdrawn)   A method of nuclear imaging, comprising:

scanning a radioactivity emitting source of at least two photon energies with at least one nuclear radiation detector, mounted on an ingestible device, and obtaining a count rate for the at least two photons;

monitoring the position of the ingestible device; and

calculating the depth of the radioactivity emitting source, at each position, based on the different attenuation of photons of different energies, emitted from the radioactivity emitting source.

10.   (Withdrawn) The method of claim 9, and further including constructing an image of the radioactivity emitting source.

11.   (Withdrawn) The method of claim 9, wherein the monitoring takes place at very short time intervals of between 100 and 200 miliseconds.

12.   (Withdrawn) The method of claim 9, wherein said nuclear-radiation detector is not collimated, to detect nuclear radiation impinging at any angle.

13.   (Withdrawn) The method of claim 9, and further including image reconstruction by deconvolution algorithms.

14. (Withdrawn) The method of claim 9, wherein said ingestible device comprises a nuclear-radiation detector, arranged for detecting gamma and beta radiation.

15. (Withdrawn) The method of claim 9, wherein said ingestible device comprises a plurality of nuclear-radiation detectors, arranged around the external surface of said ingestible device, for detecting gamma and beta radiation.

16. (New) A method of diagnosing a gastrointestinal tract, the method comprising:

inserting an ingestible device into a gastrointestinal tract of a body;

collecting diagnostic imaging data along said gastrointestinal tract by detecting nuclear radiation of a radiopharmaceutical using a plurality of nuclear radiation detectors;

determining the location and orientation of the ingestible device in the gastrointestinal tract; and

reconstructing a diagnostic image from said collected imaging data based on said location and orientation.